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A New Species of *Himertula* (Orthoptera, Tettigoniidae) and Additional Records of Tettigoniidae from Tamil Nadu (India)

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Abstract. *Himertula vidhyavathiae* sp. nov. (Phaneropterinae, Tettigoniidae) is described (holotype in Museum Alexander Koenig, Bonn). A key to the species of *Himertula* UVAROV, 1940, is given. Faunistical data for nine other species of bush-crickets (Tettigoniidae) from Chennai district in the state of Tamil Nadu (India) are provided.

Key words. *Himertula vidhyavathiae*, new species, synoptic key, taxonomy.

1. INTRODUCTION

The generic name *Himertula* was introduced by UVAROV (1940) as a replacement name for *Himerta* Brunner, 1878 that proved to be a junior homonym of *Himerta* Foerster, 1868 (Hymenoptera). Species of *Himertula* are slender, often long-winged Phaneropterinae with open tympana. According to Brunner (1878), *Himertula* is close to *Pyrrhicia* Brunner, 1878 which is a junior synonym of *Letana* Walker, 1869. Characteristic for both genera are modified male abdominalia. In *Himertula*, the cerci are strongly modified which is in contrast to *Letana* where the subgenital plate and the ninth and tenth abdominal tergites show great modifications. In *Himertula*, the last abdominal tergite can be modified as well, but never carries lateral appendages as it does in *Letana*, and the subgenital plate is simply divided from apex with the resulting lobes not curved to embrace a hole.

In the course of faunistical studies on the bush-cricket fauna of Tamil Nadu, carried out by Prof. M. C. Muralirangan and his students V. Mahalingam, N. Senthilkumar and A. Karthikeyan, a new species of *Himertula* was discovered. This is not surprising as despite some recent contributions by INGRISCH (1990), SHISHODIA et al., (1993), INGRISCH & SHISHODIA (1998, 2000), SHISHODIA (2000a, b) who have reported on the tettigoniid fauna of the Indian Subcontinent especially from eastern India, Andaman and Nicobar Islands, the Tettigoniidae fauna of India is still insufficiently known.

In the present paper a description of a new species is given together with a synoptic key to the species of the genus *Himertula* and with a list of Tettigoniidae recently collected in and around Chennai district of Tamil Nadu.

The specimens on which the present study is based are deposited in the collection of the Zoological Survey of India, Chennai, India (CZSI) exept when stated otherwise.

2. DEPOSITORIES AND ABBREVIATIONS

Depositories

CZSI	Collection of the Zoological Survey of India, Chennai, India
NZSI	Zoological Survey of India, Calcutta, National Zoological Collection
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany
BMNH	The Natural History Museum [formerly British Museum (Natural History)] London, UK

Abbreviations of species names:

kin	*H. kinneari* (Uvarov, 1923)
mgi	*H. marginata* (Brunner von Wattenwyl, 1878)
mmo	*H. marmorata* (Brunner von Wattenwyl, 1891)
pal	*H. pallisignata* Ingrisch & Shishodia, 1998
vid	*H. vidhyavathiae* n. sp.
vir	*H. viridis* (Uvarov, 1927)

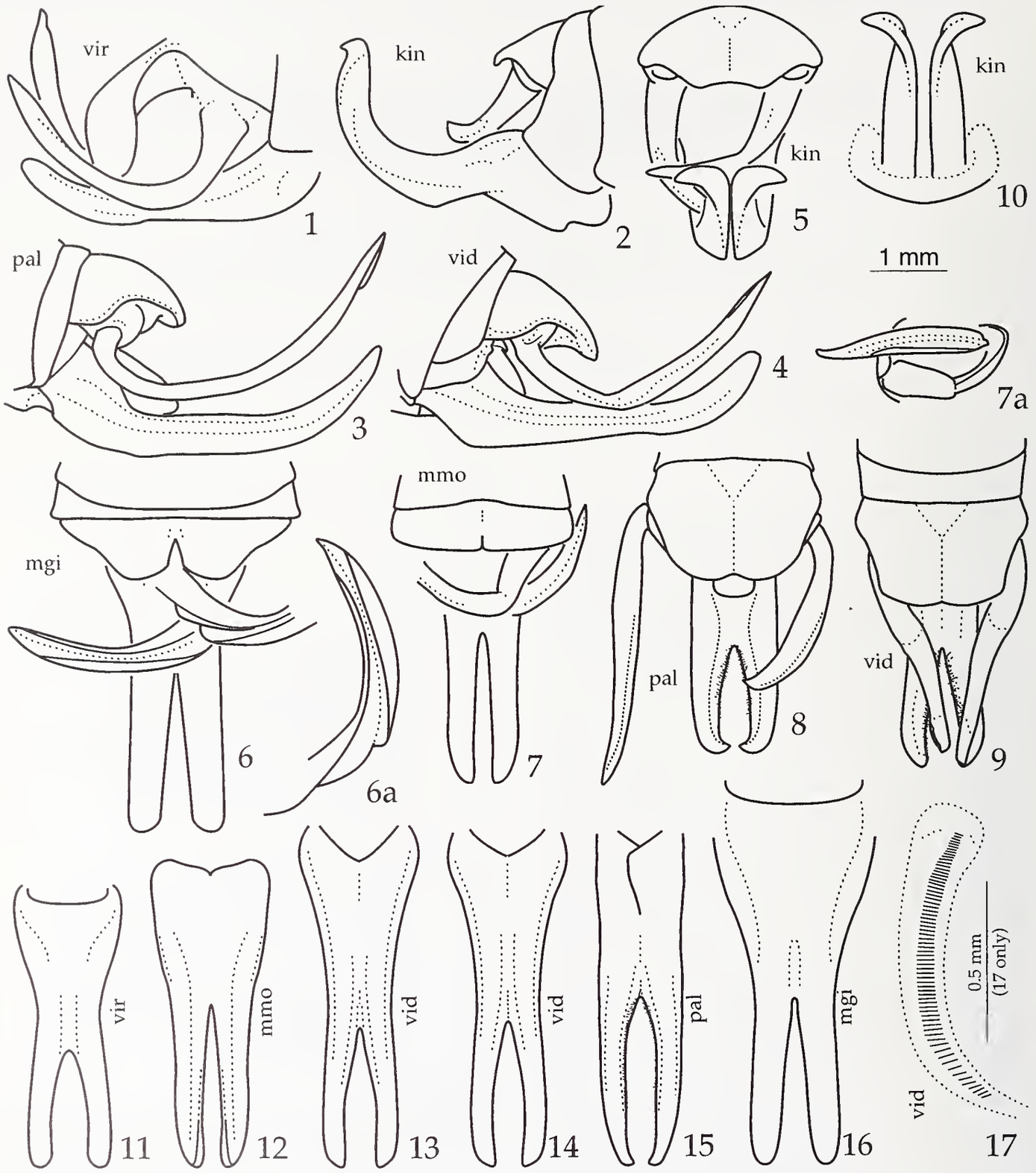
3. RESULTS

3.1. *Himertula vidhyavathiae* n. sp. (Figs. 4, 9, 14, 17, 21, 25–27)

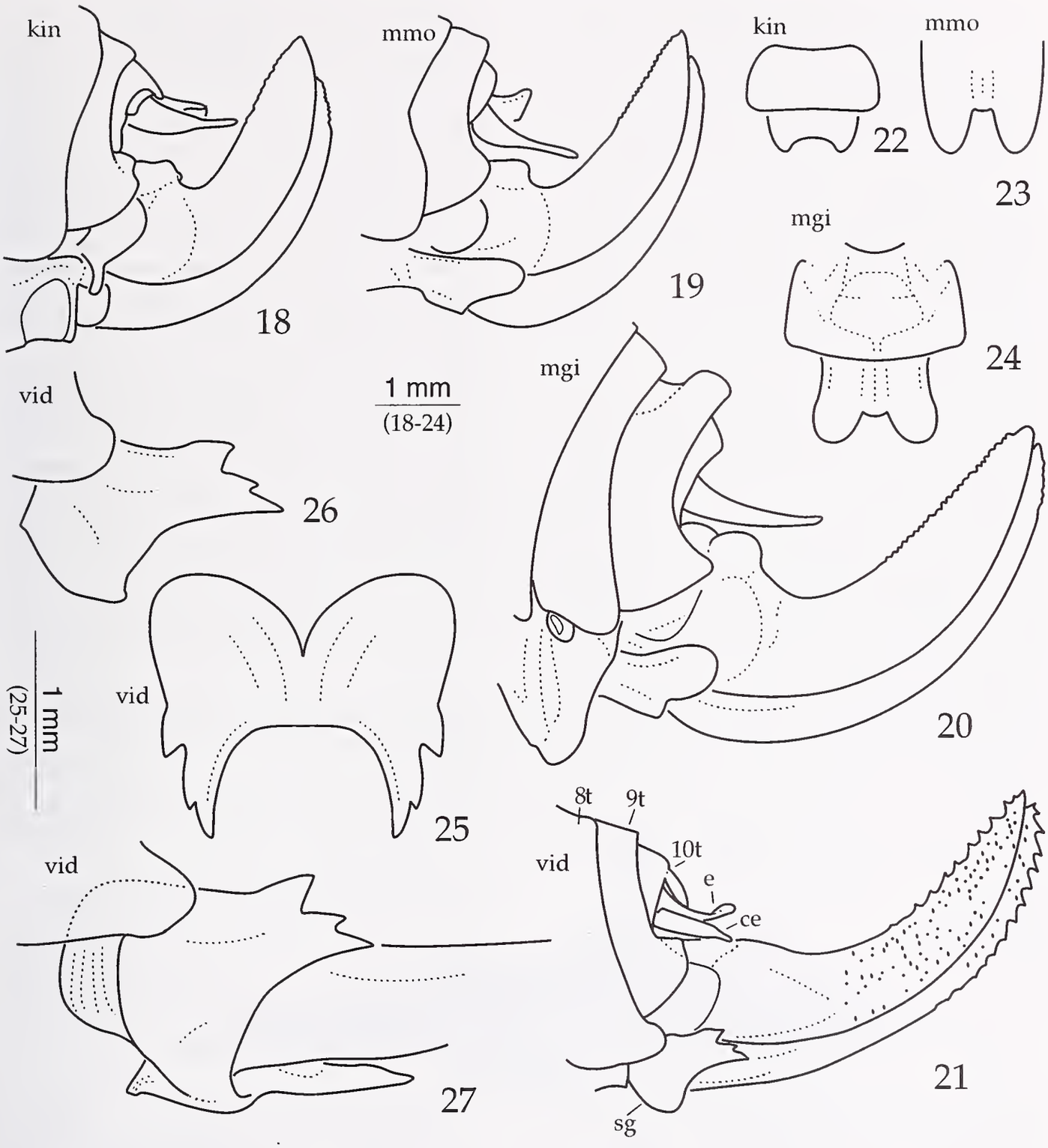
Holotype. – ♂, India, Tamil Nadu, Chengleput, wasteland about 250 m above sea level, 17.VII.1999, N. Senthilkumar (ZFMK).

Paratypes: 1 ♂, 2 ♀, same data as holotype, partly ex ovo and bred in laboratory (1 ♂, 1 ♀ CZSI, collection nr. 9792 and 9794; 1 ♀ ZFMK).

Description. Fastigium verticis conical, narrower than scapus, dorsally furrowed, separated by step-like incision from fastigium frontis. Pronotum long and



Figs. 1–17. *Himertula* males: **1–4** abdominal apex in lateral view; **5–9** abdominal apex in dorsal view (**6a**, **7a** apex of cercus); **10** subgenital plate in apical view; **11–16** subgenital plate in ventral view (**13** baso-ventral, **14** apico-ventral view); **17** stridulatory file on underside of left tegmen. – **1**, **11** *H. viridis* (Uvarov, 1927) holotype (BMNH); **2**, **5**, **10** *H. kinneari* (Uvarov, 1923) holotype (BMNH); **3**, **8**, **15**, *H. pallisignata* Ingrisch & Shishodia, 1998 holotype (NZSI); **4**, **9**, **13–14**, **17** *H. vidhyavathiae* n. sp. holotype (ZFMK); **6**, **16** *H. marginata* (Brunner von Wattenwyl, 1878) det. Uvarov, lg. Lefroy (BMNH); **7**, **12** *H. marmorata* (Brunner von Wattenwyl, 1891), Ceylon, Kandy (BMNH).



Figs. 18–27. *Himertula* females: **18–21** abdominal apex with ovipositor in lateral view; **22–25** subgenital plate in ventral view; **26** lateral apex of eight abdominal tergite and subgenital plate in lateral view; **27** ditto, with base of ovipositor and in ventro-lateral view. – **18, 22** *H. kinneari* (Uvarov, 1923) paratype (BMNH); **19, 23**, *H. marmorata* (Brunner von Wattenwyl, 1891), Ceylon (BMNH); **20, 24** *H. marginata* (Brunner von Wattenwyl, 1878) det. Uvarov, leg. Lefroy (BMNH); **21, 25-27** *H. vidhyavathiae* n. sp. paratype (ZFMK). – Abbreviations: 8t eighth, 9t ninth, 10t tenth abdominal tergites, e epiproct, ce cercus, sg subgenital plate.

narrow, disc rounded in anterior, flattened in posterior area, lateral angles rounded into paranota; anterior margin slightly concave, posterior margin faintly rounded, almost subtruncate; paranota circa 1.5 times longer than high (2.9 : 1.7 mm ♂; 3.0 : 2.0 mm ♀). Prosternum unarmed. Meso- and metasternal lobes rounded. Anterior coxa unarmed. Knee lobes of pro- and mesofemora bi-spinose (or on single femur uni-spinose), of postfemur obtuse; dorsal apex of fore and middle knees angular, of hind knees obtuse (male) or obtuse-angular (female). Tibial tympana open on both sides. Anterior tibia with dorsal and lateral surfaces furrowed, with 3 apical spurs (the dorso-internal absent) and one spine each on both ventral margins.

Male. Tegmen reaching apical third of postfemur, hind wing projecting and just surpassing hind knee. Stridulatory file on underside of left tegmen curved, with about 68 narrow teeth (Fig. 17). Tenth abdominal tergite broadly prolonged behind in middle and slightly curved ventrad, with Y–shaped median furrow; apex broad, very faintly bilobate, almost truncate (Fig. 9). Supra anal plate triangularly rounded, hidden under prolongation of tenth tergite. Cerci long, little surpassing apex of subgenital plate; narrow cylindrical and slightly curved at base, afterwards strongly compressed and almost hyaline, curved along longitudinal axis to form an internally open tube especially towards apex; apex acute (Figs. 4, 9). Subgenital plate narrow, divided from apex for little less than half of its length (Figs. 13–14); lobes moderately curved dorsad and covered on dorso-internal surface with black spinules. Phallus with large simple sclerite with converging margins in basal half, almost parallel-sided in apical half.

Coloration. Green; vertex and disc of pronotum reddish brown; tegmina with dorsal areas medium to dark brown. Central areas of abdominal tergites (in situ hidden under wings) red, except tenth abdominal tergite yellowish brown. Legs yellowish brown.

Female. Tegmen reaching just behind middle of postfemur; hind wing not reaching hind knee. Tenth abdominal tergite behind basal area narrowed and curved ventrad (Fig. 21), in dorsal view of similar shape as in male but smaller. Epiproct narrow, tongue-shaped. Cerci conical, apex pointing. Subgenital plate angularly excised from base and long and broad, roundly excised from apex; resulting lateral lobes each terminating into three acute teeth (Figs. 25–27). Ovipositor short, rather little curved for genus and margins strongly dentate towards apex (sabre-shaped; Fig. 21).

Coloration. Uniformly light ochreous brown; abdominal tergites with dorsal (= hidden) areas red, lateral areas green with red dots.

Measurements (length in mm): body ♂ 13.5, ♀ 15.0; pronotum ♂ 3.3, ♀ 3.7; tegmen ♂ 13.5, ♀ 12.5; tegmen-width ♂ 2.7, ♀ 2.8; hind wing projecting ♂ 6.0; anterior femur ♂ 4.3, ♀ 4.7; postfemur ♂ 16.5, ♀ 16.5; posttibia ♂ 18.5, ♀ 18.5; ovipositor 5.2.

Diagnosis. Regarding the male abdominal terminalia, the male of the new species is close to *Himertula pallisignata* Ingrisch & Shishodia, 1998. It differs by the cerci which are almost angularly bent instead of gradually curved, by the subgenital plate which is subapically widened in lateral view and has the apices of the apical lobes not curved mediad, and by the more contrasting coloration.

The female of the new species is close to *H. odonturaeformis* Brunner von Wattenwyl, 1891 with regard to the sabre-shaped ovipositor. It differs by shorter tegmina, the hind wings hardly projecting (instead of projecting for one quarter the length of a tegmen), and by the subgenital plate with the apices of the lateral lobes being tri-dentate instead of obliquely truncate. The females of other species of *Himertula* described so far have a sickle-shaped ovipositor.

The habitus of *H. vidhyavathiae* is illustrated in Figs. 28-29. More images can be found in the Dorsa database (http://www.dorsa.de). Images of other *Himertula* species are available at the Orthoptera Species File Online (http://140.247.119.145/Orthoptera).

Etymology. The name of the new species is dedicated to the well known Indian philanthropist Vidhyavathi, her trust has provided more than 500 scholarships to assist in the education of poor people.

Key to the species of *Himertula* Uvarov, 1940

Together with the new species, eight species are recognised in *Himertula* Uvarov, 1940. They can be separated according to the following key. As both sexes for all species are not yet known, separate keys are given for males and females.

Males.

1. Subgenital plate in lateral view only moderately curved dorsad or almost straight (Figs. 1, 3–4); apices of apical lobes rounded or slightly curved mediad (Figs. 11–16) 2

– Subgenital plate in lateral view strongly curved dorsad in an almost 90° angle (Fig. 2); apices of apical lobes curved laterad (Fig. 10) . . . . . *H. kinneari* (Uvarov, 1923)

2. Tenth abdominal tergite prolonged into two long lobes curved ventrad (Fig. 1). Coloration uniformly green . . . . . *H. pallida* (Brunner von Wattenwyl, 1891) and *H. viridis* (Uvarov, 1927)*

– Tenth abdominal tergite truncate or moderately prolonged, if prolonged gradually curved (Figs. 2–4), coloration green with brown pattern (the pattern can be pale but is always distinct) 3

3. Tenth abdominal tergite short with apex truncate, obliquely truncate, or divided into two short rounded lobes (Figs. 6–7). 4

– Tenth abdominal tergite prolonged with apical margin only faintly excised in middle (Figs. 8–9) 5

4. Pronotum with lateral lobes lightly coloured. Alae projecting about one quarter the length of a tegmen . . . . . *H. marginata* (Brunner von Wattenwyl, 1878)

– Pronotum with lateral lobes brown with only ventral margin lightly coloured. Alae projecting almost half the length of a tegmen . . . . . *H. marmorata* (Brunner von Wattenwyl, 1891)

5. Cerci gradually curved (Fig. 3). Subgenital plate in lateral view with approaching margins in apical area; apices of apical lobes slightly curved mediad (Fig. 15) . . . . . *H. pallisignata* Ingrisch & Shishodia, 1998

– Cerci angularly curved (Fig. 4). Subgenital plate in lateral view widened in subapical area; apices of apical lobes not curved mediad (Fig. 14). . . . . *H. vidhyavathiae* n. sp.

Females.

1. Ovipositor sabre-shaped: moderately curved throughout with strongly dentate margins in apical half (Fig. 21) 2

– Ovipositor sickle-shaped: strongly upcurved behind base with weakly serrated margins towards apex (Figs. 18–20) 3

2. Subgenital plate with apices of lateral lobes obliquely truncate. Hind wings projecting for one quarter the length of a tegmen . . . . . *H. odonturaeformis* (Brunner von Wattenwyl, 1891)

– Subgenital plate with the apices of the lateral lobes being tri-dentate (Figs. 25-27). Hind wings hardly projecting behind tegmina . . . *H. vidhyavathiae* n. sp.

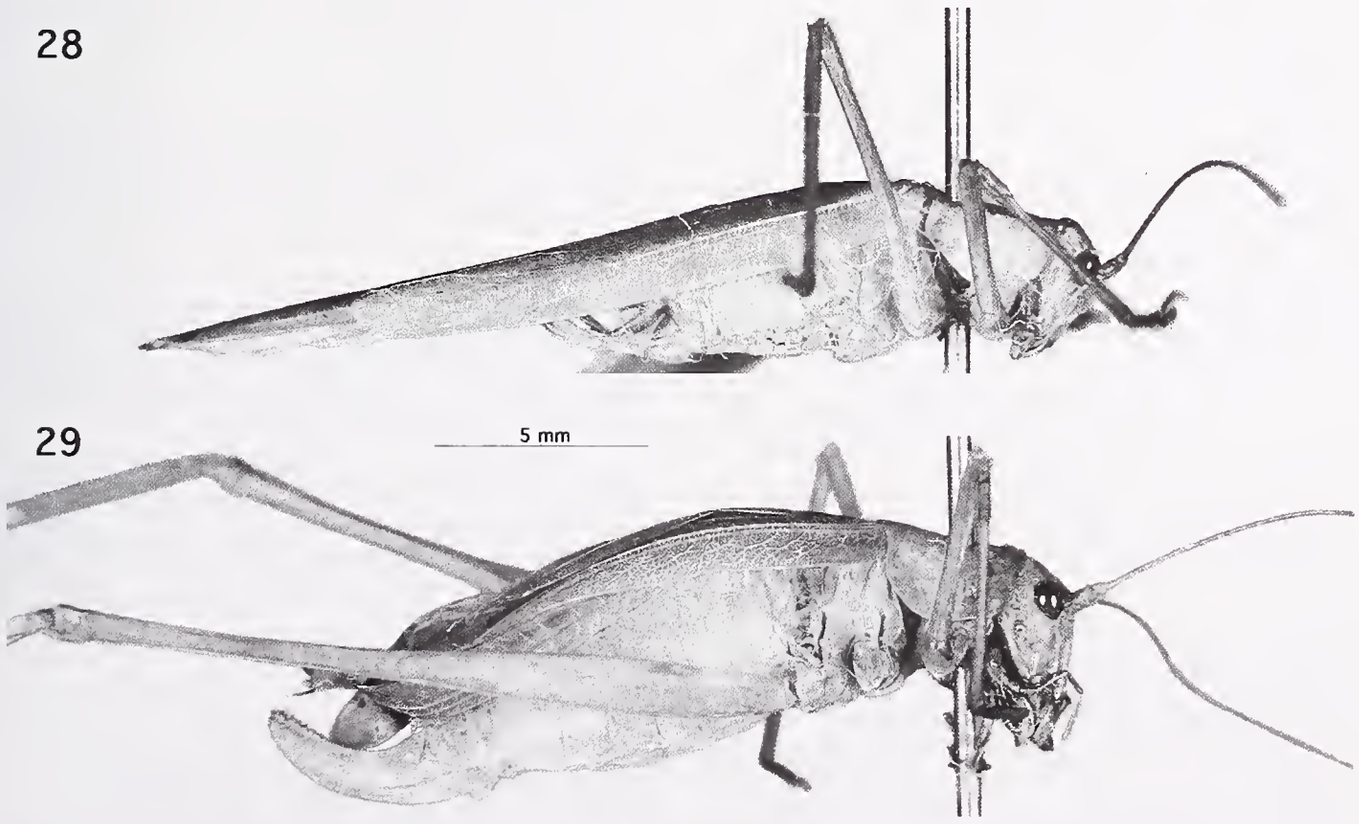
3. Ovipositor 4.0-4.5 mm, apex acute (Figs. 18-19). 4

– Ovipositor more than 5 mm, apex less acute (Fig. 20) . . . *H. marginata* (Brunner von Wattenwyl, 1878)

4. Subgenital plate with apico-lateral angles produced into distinct lobes (Fig. 23) . . . . . *H. marmorata* (Brunner von Wattenwyl, 1891)

– Subgenital plate with apico-lateral angles little produced (Fig. 22) . . . . . *H. kinneari* (Uvarov, 1923)

* Remark. It could be possible that *H. viridis* (Uvarov, 1927) is a synonym of *H. pallida* (Brunner von Wattenwyl, 1891), but without re-examining the type of *H. pallida* this is not certain. The main described difference between both taxa is the curvation of the cerci which is said to be „incurved" in *H. pallida* and „recurved" [upcurved] in *H. viridis*. But this could be due to the fact that the moveable cerci are fixed in different conditions. Both taxa are described from Sri Lanka.



Figs. 28-29. *Himertula vidhyavathiae* n. sp.: **28** holotype male; **29** paratype female.

3.2. Additional Records

Subfamily: Phaneropterinae

Holoclilora spectabilis (Walker, 1869)
Distribution: Previously only known from Sri Lanka.
Locality: 1 ♂, Meenakshi College Campus, Kodambakkam, Chennai, Tamil Nadu, India, 21.VI.1999, M.C. Muralirangan.

Trigonocorypha unicolor (Stoll, 1787) [= *T. crenulata* (Thunberg, 1815)]
Distribution: Indian subcontinent.
Locality: 1 ♀, Guindy Reserve Forest, Tamil Nadu, India, 16.VI.1999, N. Senthilkumar.

Elimaea (Orthelimaea) securigera (Brunner von Wattenwyl, 1878)
Distribution: Indian subcontinent.
Locality: 1 ♂, Loyola College Campus, Nungambakkam, Chennai, Tamil Nadu, India, 27.VII.1999, A. Karthikeyan.

Phaneroptera gracilis (Burmeister, 1838)
Distribution: Tropical regions from Africa to Australia.
Locality: 1 ♀, Loyola College Campus, Nungambakkam, Chennai, Tamil Nadu, India, 27.VII.1999, A. Karthikeyan.

Subfamily: Pseudophyllinae

Satlirophyllia fuliginosa Stål, 1874
Distribution: India and Indo-China.
Locality: 2 ♀♀, Guindy Reserve Forest, Tamil Nadu, India, 19.VIII.1999, N. Senthilkumar.

Acanthoprion suspectum (Brunner von Wattenwyl, 1895)
Distribution: Sri Lanka and South India (Malabar coast, Madura).
Locality: 1 ♀, Meenakshi College Campus, Kodambakkam, Chennai, Tamil Nadu, India, 25.VI.1999, M.C. Muralirangan.

Paramorsimus oleifolius (Fabricius, 1793)
Distribution: South India (described from Tranquebar) and Sri Lanka.
Locality: 1 ♂, Guindy Reserve Forest, Tamil Nadu, India, N. Senthilkumar.

Subfamily: Conocephalinae

Conocephalus maculatus (Le Guillou, 1841)
Distribution: Tropical regions from Africa to Australia.
Locality: 1 ♂, 1 ♀, Guindy Reserve Forest, Tamil Nadu, India, 2.VII.1999, N. Senthilkumar.

Euconocephalus incertus (Walker, 1869)
Distribution: India, Sri Lanka (type locality), Arabian peninsula.
Locality: 1 ♀, Guindy Reserve Forest, Tamil Nadu, India, 2.VII.1999, S. Johny.

4. DISCUSSION

Species of the genus *Himertula* are so far all reported from the Indian subcontinent including Sri Lanka and the Himalayan area. Jin & Xia (1994) included *H. marginata* in a checklist of Chinese Tettigoniidae as a species living in the border area with India without giving proven records. From the scarce faunistical data, it may be concluded that most species are vicariantly distributed, some with overlapping areas in Sri Lanka and the Himalayas. *H. kinneari* (Uvarov, 1923) was reported from West India (type locality Bombay) to Nepal and Bhutan; *H. marmorata* (Brunner von Wattenwyl, 1891), *H. pallida* (Brunner von Wattenwyl, 1891) and *H. viridis* (Uvarov, 1927) are known from Sri Lanka; *H. marginata* (Brunner von Wattenwyl, 1878) was described from "Himalaya", *H. pallisignata* Ingrisch & Shishodia, 1998 from Rajasthan, *H. vidhyavathiae* n. sp. from Tamil Nadu, and *H. odonturaeformis* (Brunner von Wattenwyl, 1891) from India without details. When more detailed faunistical data becomes available, this picture will probably change.

The holotype of *H. vidhyavathiae* was collected from wasteland in Chengleput about 250 m above sea level. Other individuals were found in similar areas up to 1800 m, but were more common at lower elevations (M.C. Muralirangan pers. obs.). The species occurred in a variety of habitats including: grassy patches near agricultural land, wasteland, high altitude grassland, and forests. *Himertula kinneari* was found in agricultural area with shrubs in Nepal (S. Ingrisch pers. obs.).

Other species of bush-crickets that occurred together with *H. vidhyavathiae* n. sp. are compiled in the preceding preliminary list of the Tettigoniidae of Chennai district in Tamil Nadu (all specimens in CZSI).

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The identification key for *Himertula* is mainly based on types and other specimens in the Natural History Museum London (BMNH). The visit to the BMNH by S. Ingrisch was made possible by a grant of the Bioresource project which is part of the TMR Programme of the Commission of the European Union.

REFERENCES

Brunner von Wattenwyl, C. (1878): Monographie der Phaneropteriden. 1–401, pl.1–8; Brockhaus, Wien.

Ingrisch, S. (1990): Grylloptera and Orthoptera s. str. from Nepal and Darjeeling in the Zoologische Staatssammlung München. Spixiana **13**: 149–182.

INGRISCH, S. & SHISHODIA, M. S. (1998): New species and new records of Tettigoniidae from India (Ensifera). Mitteilungen der schweizerischen entomologischen Gesellschaft **71**: 355–371.

INGRISCH, S. & SHISHODIA, M. S. (2000): Contribution to the Tettigoniidae fauna (Ensifera) of India. Mitteilungen der Münchner entomologischen Gesellschaft **90**: 5–37.

JIN, X. & XIA, K. (1994): An Index–Catalogue of Chinese Tettigoniodea (Orthopteroidea: Grylloptera). Journal of Orthoptera Research **3**: 15–41.

SHISHODIA, M.S., MITRA, B. & TANDON, S.K. (1993): On the Orthoptera of Andaman and Nicobar Islands. Journal of the Andaman Science Association **9**: 35–43.

SHISHODIA, M.S. 2000a. Short and Long-horned grasshoppers and crickets of Bastar District, Madhya Pradesh, India. Records of the Zoological Survey of India, Calcutta **98**: 27–80.

SHISHODIA, M.S. 2000b. Orthoptera (Insecta) fauna of Andaman and Nicobar Islands. Records of the Zoological Survey of India, Calcutta **98**: 1–24.

UVAROV, B.P. 1940. Twenty-eight new generic names in Orthoptera. Annals and Magazine of natural History (11) **5**: 173–176.

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